

BEFORE

THE PUBLIC SERVICE COMMISSION OF
SOUTH CAROLINA

DOCKET NO. 97-239-C-ORDER NO. 98-322

MAY 6, 1998

IN RE: Proceeding to Establish Guidelines) ORDER ON UNIVERSAL
for an Intrastate Universal Service) SERVICE COST MODELS
Fund)

I. PROCEDURAL BACKGROUND

This matter comes before the South Carolina Public Service Commission ("Commission") in connection with the Commission's obligations under S.C. Code Ann. § 58-9-280(E) (Supp. 1997) to establish an intrastate universal service fund ("USF") for distribution to carriers of last resort. Further, as discussed below in more detail, this matter comes before the Commission in connection with its obligations under federal law to select a cost proxy model for use in calculating interstate support for non-rural incumbent local exchange carriers ("ILECs") serving rural, insular and high cost areas in South Carolina. On May 29, 1997, in response to this statutory obligation, the Commission issued a Notice of Proceeding creating a proceeding to establish guidelines as may be necessary for the funding and management of the USF including issues related to the size of the USF. The Commission assigned Docket No. 97-239-C to the matter.

Numerous parties intervened in Docket No. 97-239-C including BellSouth Telecommunications, Inc. ("BellSouth"), the Consumer Advocate for the State of South Carolina ("Consumer Advocate"), the South Carolina Cable Television Association ("SCCTA"), MCI Telecommunications Corporation ("MCI"), South Carolina Public Communications Association ("SCPCA"), John C. Ruoff, Ph.D. ("Ruoff"), American Communications Services, Inc. ("ACSI"), AT&T Communications of the Southern States, Inc. ("AT&T"), South Carolina Budget and Control Board, Office of Information Resources ("OIR"), Worldcom, Inc. ("Worldcom"), Alliance for South Carolina's Children ("Alliance"), Parents Reaching Out to Parents of South Carolina, Inc. ("PRO-Parents"), GTE South Incorporated ("GTE"), South Carolina Fair Share and the Women's Shelter ("SC Fair Share"), LCI International Inc. ("LCI"), South Carolina Telephone Association ("SCTA"), South Carolina Telephone Coalition ("SCTC"), and United Telephone Company ("United").

In Order No. 97-516, dated June 13, 1997, the Commission clarified that an intrastate USF fund would be established in the following manner. First, the Commission would establish guidelines for the fund, including estimating the size of the level of support to be trued up or down after the Commission determines the actual methodology to be used. Second, the Commission stated it would hold a separate hearing to accept and

evaluate evidence regarding specific methodologies to be used in determining the actual size of the intrastate USF. Order No. 97-516.

An initial public hearing in this docket was held on August 4, 1997. In Order No. 97-753, dated September 3, 1997, the Commission addressed the USF guidelines, adopted with certain modifications the guidelines proposed by the SCTA, and deferred ruling on certain sections. Pursuant to the requirements of S.C. Code Ann. § 58-9-280(E)(4), the Commission estimated the size of the USF to be \$439.7 million. In Order No. 97-942, dated December 31, 1997, the Commission granted in part and denied in part various petitions for rehearing and/or reconsideration of Order No. 97-753, emphasizing that the actual size of the USF would be determined de novo in future Commission proceedings. In Order No. 98-201, dated March 17, 1998, the Commission granted reconsideration in part of Order No. 97-942, reinstating certain parts of Order No. 97-753 which had been deleted in Order No. 97-942.

In Order No. 97-958, dated November 24, 1997, the Commission designated BellSouth, United, GTE and the member companies of the South Carolina Telephone Coalition as telecommunications carriers eligible to receive universal service support under section 214(e)(2) of the Telecommunications Act of 1996.

A second public hearing in this docket was held on November 19, 1997, for the limited purpose of receiving testimony and permitting cross-examination of SCTA witnesses Alphonso Varner and Keith Oliver, and SCTC witnesses Azita Sparano, and Douglas Meredith, pursuant to Commission Order No. 97-1001, dated November 20, 1997. The hearing was thereafter recessed until a later date, and ultimately reconvened on March 9, 1998. The public hearing concluded on March 11, 1998.

During the USF hearings, BellSouth was represented by Caroline N. Watson, William F. Austin, J. Phillip Carver, William J. Ellenberg, II and Edward L. Rankin, III. BellSouth presented the testimony of Dr. Randall S. Billingsley, G. David Cunningham, Peter F. Martin, D. Daonne Caldwell, Jamshed K. Madan, Michael D. Dirmeier, and David C. Newton.

United was represented by Richard Whitt and James Wright. United presented the testimony of Jerome C. Weinert, Wayne Jones, Dr. Brian Staihr, and Steve Parrott.

BellSouth and United jointly presented the testimony of Dr. Kevin Duffy-Deno, Dr. Robert Bowman, and Dr. Brian Staihr.

SCTA and SCTC were represented by M. John Bowen, Jr. and Margaret Fox. SCTA presented the testimony of Alphonso Varner and Keith Oliver. The SCTC presented the testimony of Azita

Sparano and Douglas Meredith. The SCTA and SCTC witnesses testified on November 19, 1997.

The Consumer Advocate was represented by Elliott F. Elam, Jr. The Consumer Advocate presented the testimony of John B. Legler and Allen G. Buckalew.

MCI was represented by John M. S. Hoefer, and Paige Gossett. MCI presented the testimony of Thomas Hyde.

AT&T was represented by Francis P. Mood, Robin Dunson, Steve A. Matthews and Steven Ruscus. AT&T presented the testimony of James W. Wells, Brian F. Pitkin, Art Lerma, Richard Guepe, David L. Kaserman, Mike Guedel, Don Wood, James W. Currin, and John I. Hirshleifer.

GTE was represented by Steven W. Hamm, Joe Foster, Ed Fuhr and Rich Harper. GTE presented the testimony of Gregory Jacobson, Allen E. Sovereign, Michael R. Norris, Dr. Timothy J. Tardiff, Mark S. Calnon, and Francis Murphy.

SCPCA was represented by John F. Beach. SCPCA presented the testimony of Walter Rice.

ACSI was represented by Russell B. Shetterly. ACSI presented no witnesses.

SCCTA was represented by B. Craig Collins. SCCTA presented no witnesses.

The Commission's Staff was represented by F. David Butler. The Commission Staff presented no witnesses during this phase of the proceeding.

II. SUMMARY OF TESTIMONY

ALPHONSO J. VARNER

The SCTA presented the direct testimony of Alphonso J. Varner, Senior Director for State Regulatory for BellSouth Telecommunications, Inc. Mr. Varner addressed the general topic of universal service and what the SCTA should do to ensure it is preserved in South Carolina. Mr. Varner addressed policy issues regarding USF. Mr. Varner outlined costing principles developed by the SCTA which he testified were consistent with the Telecommunications Act of 1996 as well as the Federal Communications Commission's ("FCC") May 8, 1997 Report and Order in Docket No. 96-45. Mr. Varner also testified as to the guidelines approved by the Commission in its Order No. 97-757 as well as the modifications proposed by the SCTA in Sections 9 and 11 which were deferred in the initial universal service proceeding.

H. KEITH OLIVER

The SCTA presented the direct testimony of Keith J. Oliver, Vice-President Finance, Home Telephone Company, Inc. Mr. Oliver

testified about the administrative procedures developed by the SCTA for use in the USF guidelines.

DOUGLAS MEREDITH

The SCTC presented the direct testimony of Douglas Meredith. Mr. Meredith is the Director of Economics and Pricing Division of John Staurulakis, Inc. (JSI) in Alpharetta, Georgia. Mr. Meredith testified regarding the treatment of costs for rural carriers in South Carolina. He testified to the methodology used to determine the size of the intrastate USF for those companies as listed. All these companies are incumbent local exchange carriers ("ILECs") who have carrier of last resort (COLR) status within South Carolina.

AZITA SPARANO

The SCTC presented the direct testimony of Ms. Sparano. Ms. Sparano is Director of Southeast Operations of John Staurulakis Inc. (JSI) of Alpharetta, Georgia. Ms. Sparano testified as to a detailed outline of the embedded cost methodology as described by witness Meredith. She also presented the result of the application of that methodology for the SCTC Company.

RANDALL BILLINGSLEY

Dr. Billingsley, a finance professor at Virginia Polytechnic Institute and State University, filed rebuttal testimony on behalf of BellSouth. Prior to the hearing, the parties agreed to

stipulate to Dr. Billingsley's rebuttal testimony into the record. The Commission approved the stipulation. Dr. Billingsley attempted to rebut the testimony of John I. Hirshleifer and a statement of Matthew I. Kahal which was relied upon by Don Wood in his testimony. Mr. Hirshleifer and Mr. Wood testified on behalf of AT&T.

Specifically, Dr. Billingsley testified that Hirshleifer erroneously estimated BellSouth Corporation's cost of equity to be only 10.99% to 11.05% and BellSouth Telecommunications, Inc.'s ("BST") overall cost of capital to be only 9.43%. Dr. Billingsley's testimony included an explanation of the errors and inconsistencies in Hirshleifer's discounted cash flow ("DCF") and capital asset pricing model ("CAPM") analyses of BellSouth Telecommunications, Inc.'s cost of equity capital. Dr. Billingsley determined an overall cost of capital for BST of 11.25%. Dr. Billingsley also attempted to rebut Kahal's cost of capital analysis for LECs as being unrealistically low.

G. DAVID CUNNINGHAM

BellSouth presented the rebuttal testimony of G. David Cunningham, Director of Finance for BellSouth. Prior to the hearing, the parties agreed to stipulate Cunningham's rebuttal testimony into the record. The Commission approved the stipulation. Mr. Cunningham testified in response to the direct

testimony of James W. Currin on behalf of AT&T regarding the economic lives used in BellSouth's calculation of universal service costs. Mr. Cunningham testified as to the appropriateness of the forward-looking economic lives developed by BellSouth's Depreciation organization and provided for use in BellSouth's first study using the BCPM 3.1 Model.

JAMES W. CURRIN

AT&T presented the direct and rebuttal testimony of Mr. James W. Currin. Mr. Currin is a Senior Consultant of the economic consulting firm of Snavelly King Majoros O'Connor & Lee, Inc. in Washington, DC. Prior to the hearing, the parties agreed to stipulate Mr. Currin's direct and rebuttal testimony into the record. The Commission approved the stipulation. Mr. Currin testified that he was responding to the testimony of Daonne Caldwell who presented the depreciation lives proposed by BellSouth, and Michael Norris and Allen E. Sovereign, who presented the lives used by GTE South. Mr. Currin testified that he compared these lives to those appropriate for universal cost calculations pursuant to the Commission Order of September 3, 1997 and to the lives used in the Hatfield Model.

Mr. Currin testified as a rebuttal witness to the testimony of G. David Cunningham (BellSouth) on the subject of the appropriate economic lives and future net salvage percents to be

used in calculating depreciation pursuant to the Universal Services Order of the FCC.

JOHN I. HIRSHLEIFER

AT&T presented the direct and rebuttal testimony of John I. Hirshleifer, Vice President and Director of Research of FinEcon of Los Angeles, California. Prior to the hearing, the parties agreed to stipulate Mr. Hirshleifer's direct and rebuttal testimony into the record. The Commission approved the stipulation.

Mr. Hirshleifer testified as to the estimate of the forward-looking cost of capital that should be used in determining the telephone subsidiaries of GTE and BellSouth and for United Telephone Company of the Carolinas, and the forward looking cost of capital appropriate for the provision of universal service. Mr. Hirshleifer testified that the midpoint of his cost of capital range for the provision of universal services is 9.43% for BellSouth and 9.60% for GTE and 9.53% for United.

AT&T presented Mr. Hirshleifer to attempt to rebut BellSouth's proposal to adopt a 11.25% cost of capital. Mr. Hirshleifer also testified as a rebuttal witness to the testimony of Dr. Billingsley.

THOMAS HYDE

MCI presented the direct testimony of Thomas Hyde. Mr. Hyde is a consultant for MCI. Prior to the hearing, the parties agreed to stipulate Mr. Hyde's direct and revised direct testimony into the record. The Commission approved the stipulation. Mr. Hyde testified as to certain aspects of the testimony of Douglas Meredith filed by the SCTC.

GREGORY D. JACOBSON

GTE presented the rebuttal testimony of Gregory D. Jacobson, Vice President and Treasurer of GTE Telephone Operating Companies. Prior to the hearing, the parties agreed to stipulate Mr. Jacobson's rebuttal testimony into the record. The Commission approved the stipulation. Mr. Jacobson testified in support of the capital structure and overall weighted average cost of capital (WACC) used in the cost studies presented by GTE. Mr. Jacobson testified that the WACC reflects forward-looking costs consistent with prevailing economic theory. Mr. Jacobson also attempted to rebut certain issues raised in the direct testimony of John I. Hirshleifer on behalf of AT&T. Mr. Jacobson testified that Mr. Hirshleifer had made certain arbitrary assumptions and modifications to the application of the DCF, CAPM and capital structure that are inconsistent with prevailing economic theory and which individually and

collectively bias Mr. Jacobson's results and understate the forward-looking cost of capital for GTE South.

DAVID L. KASERMAN

AT&T presented the direct testimony of David L. Kaserman, an economist, employed as Torchmark Professor of Economics at Auburn University. Prior to the hearing, the parties agreed to stipulate Dr. Kaserman's direct testimony into the record. The Commission approved the stipulation. Dr. Kaserman described some fundamental economic principles that apply to issues raised by the Commission's current efforts to reform the system through which the policy objective of universal service is pursued. Dr. Kaserman testified that these principles are useful both in describing the overall characteristics that should be incorporated in the new system and in guiding the selection of an appropriate cost model for use in operating that system.

JOHN LEGLER

The Consumer Advocate presented the surrebuttal testimony of John Legler, Professor of Banking and Finance from the University of Georgia. Prior to the hearing, the parties agreed to stipulate Dr. Legler's surrebuttal testimony into the record. The Commission approved the stipulation. Dr. Legler testified in his surrebuttal testimony that BellSouth Telecommunications had a

rate of return of common equity of 11.00% and GTE had a rate of return on common equity of 11.80%.

WALTER RICE

The South Carolina Public Communications Association (SCPCA) presented the direct testimony of Walter Rice. Mr. Rice is President of R&R Communications and is the President of the South Carolina Public Communications Association (SCPCA). Prior to the hearing, the parties agreed to stipulate Mr. Rice's direct testimony into the record. The Commission approved the stipulation. Mr. Rice testified as to the appropriate way in which Payphone Service Providers ("PSPs") should contribute to Universal Service in South Carolina.

ALLEN SOVEREIGN

GTE presented the rebuttal testimony of Allen E. Sovereign. Mr. Sovereign is employed by GTE Telephone Operations as Manager-Capital Recovery in Texas. Prior to the hearing, the parties agreed to stipulate Mr. Sovereign's rebuttal testimony into the record. The Commission approved the stipulation. Mr. Sovereign attempted to rebut the direct testimony of James W. Currin.

JEROME C. WEINERT

United presented the rebuttal testimony of Jerome C. Weinert, Vice President of Associated Utility Services, Inc. of Wisconsin. Prior to the hearing, the parties agreed to stipulate

Mr. Weinert's rebuttal testimony into the record. The Commission approved the stipulation. Mr. Weinert testified as to the appropriateness of the depreciation lives and net salvage factors to be utilized by United in its model (BCPM 3.1) for determining the cost of telecommunications services that should be supported by the universal service funding mechanism and to attempt to rebut evidence presented by intervenors to this proceeding contrary to United's proposed depreciation parameters.

BRIAN K. STAIHR

BellSouth and United presented the direct, revised direct and rebuttal testimonies of Brian K. Staihr. Mr. Staihr is a regulatory economist with Sprint United Management Company in Kansas. Mr. Staihr testified regarding the proper costing methodology that should be used in determining explicit universal service support for the state of South Carolina. Mr. Staihr testified that the costing methodology should be the Benchmark Cost Proxy Model. Mr. Staihr testified in his rebuttal testimony as to certain issues raised in the direct testimonies of AT&T witnesses Don Wood and Jim Wells. Mr. Staihr testified that these issues deal specifically with the Hatfield Model Version 5.0a and also presented a sensitivity analysis of key inputs to both models filed, Hatfield 5.0a and BCPM 3.1.

KEVIN T. DUFFY-DENO

BellSouth and United presented the direct and rebuttal testimony of Kevin T. Duffy-Deno, Managing Director-Market Research at INDETEC, International in Utah. Dr. Duffy-Deno testified, along with Dr. Robert Bowman, in lieu of Dr. Richard D. Emmerson's testimony, about the BCPM.

Dr. Duffy-Deno testified in response to testimony filed by AT&T in support of a new release of the Hatfield Model, Release 5.0a. Dr. Duffy-Deno testified specifically regarding Don Wood's assertions regarding HM 5.0a.

ROBERT M. BOWMAN

BellSouth and United presented the direct and rebuttal testimony of Robert M. Bowman, an independent telecommunications consultant from Colorado. Dr. Bowman testified in lieu of Dr. Richard B. Emmerson, explaining the BCPM. Dr. Bowman testified that, from an engineering perspective, the BCPM Version 3.1 is the appropriate model to rely upon in estimating the costs of universal service for BellSouth and United's territory in South Carolina. Dr. Bowman testified as to its forward-looking network for efficient universal service. Dr. Bowman also testified as to how the BCPM 3.1 integrates its customer location methodology with its network design to ensure that engineering design and constraints reflect the underlying customer location data.

PANEL BY WAYNE H. JONES AND DR. BRIAN STAIHR

United presented the direct panel testimony of Wayne H. Jones, Manager of Service Costing for Sprint-Mid-Atlantic in North Carolina and Dr. Brian Staihr, Regulatory Economist, Sprint United Management Company in Kansas. The panel testified as to United's use of the BCPM, Version 3.1 for determining the cost of providing Universal Service in South Carolina.

CHARLES S. PARROTT

United presented the direct testimony of Steve Parrott, Sprint's Mid-Atlantic Operations Director - Regulatory Affairs, North Carolina. Mr. Parrott testified as to the results and calculations supporting United's requirement for explicit universal service support in South Carolina and to share certain of the policy views of Sprint on critical universal service issues.

DAONNE CALDWELL

BellSouth presented the revised direct and supplemental direct testimony of Daonne Caldwell, Director of Finance for BellSouth Telecommunications, Inc. On Tuesday, March 10, 1998, due to a sudden family illness, the parties agreed to stipulate as to Ms. Caldwell's testimony with the understanding that the cross-examination of her in the jurisdictions of Alabama and Louisiana also be received into the record. The Commission

approved the stipulation. Ms. Caldwell's filed testimony explained and supported BellSouth's cost methodology for calculating universal service costs. Ms. Caldwell's testimony was that BellSouth had determined that the BCPM Version 3.1 most closely reflects the cost of providing universal service to BellSouth's South Carolina customers. Subsequently BellSouth filed universal service cost studies based on BCPM 3.1, which included refinements to the digital loop carrier and feeder/distribution interface calculations; feeder cable calculation to provide for cable requirements to handle unoccupied housing units; distribution cable costs associated with the limitation of quadrant cable lengths and switching fixed costs.

MICHAEL NORRIS

GTE presented the direct, updated supplemental direct and revised updated supplemental direct testimony of Michael R. Norris, GTE Service Corporation Manager - Cost Models and Methods Development, Texas. Mr. Norris' direct testimony addresses why company-specific costs studies are appropriate for estimating both the costs of unbundled network elements and universal service support requirements. Mr. Norris' also testified as to why cost proxy models are not appropriate. Mr. Norris also testified as to GTE's integrated Cost Model (ICM) which he

testified was the appropriate model to estimate GTE's costs for both the determining of rates for unbundled network elements (UNEs) and universal service support requirements. However, the ICM was not available for consideration in this proceeding.

GTE presented Mr. Norris' updated testimony. Mr. Norris' testimony supported of a new version of the BCPM, Version 2.5. Mr. Norris testified to his revised results of the new release of BCPM 3.1.

GTE presented Mr. Norris' revised supplemental direct testimony. Mr. Norris' testimony provided revised results of BCPM 3.1 based on a corrected understanding of cable sizing function for distribution plant. Mr. Norris testified the change results in a decrease of the Company's cost per line estimate.

MARK S. CALNON

GTE presented the direct, supplemental, updated supplemental direct, revised updated supplemental direct and rebuttal testimonies of Mark S. Calnon, Director of Pricing and Tariffs for GTE Service Corporation in Texas. Mr. Calnon testified in his direct testimony of the implications of removing the implicit subsidies contained in the incumbent local exchange carriers (ILECs) rates consistent with Section 254(f) of the Telecommunications Act of 1996.

Mr. Calnon's supplemental testimony provided an update to the universal service funding for GTE. The change was a direct result of an updated analysis using the BCPM Version 2.5 model.

Mr. Calnon's updated supplemental direct testimony updated the direct result of an updated BPCM Version 3.1 model.

Mr. Calnon provided revised updated supplemental testimony updating a change in the result of an input correction to the BCPM Version 3.1. All changes are explained in Mr. Norris' revised updated supplemental direct testimony.

Mr. Calnon's rebuttal testimony was filed to address the issues raised by AT&T witnesses Kaserman, Guepe and Guedel and Bucklew on behalf of the Consumer Advocate.

DON J. WOOD

AT&T presented the direct and supplemental direct testimonies of Don J. Wood, consultant from Georgia. Mr. Wood testified as to Release 4 of the Hatfield Model sponsored by AT&T. Mr. Wood also testified as to the results of the model run to determine universal service funding requirements for each tier I ILEC in South Carolina. In addition, Mr. Wood testified as to the results of analysis of switching cost assumptions used by Sprint and BellSouth in their costing model.

Mr. Wood's supplemental direct testifies as to the release of the Hatfield Model 5.0a.

JAMES W. WELLS, JR.

AT&T presented the direct and supplemental testimonies of James W. Wells, Jr., District Manager - Outside Plant Cost Engineering for AT&T. Mr. Wells testified to the OSP inputs to the local loop portion of the Hatfield Model; his analysis of modifications to the OSP of the BCPM 2.0; rebuttal testimony to specific portions of direct testimony of BST and GTE's witnesses and address criticisms of the Hatfield Model.

Mr. Wells' supplementally testified as to the enhancements of OSP modeling methodology and input values as to the local loop portions of the Hatfield Model and validation as to the input values.

BRIAN F. PITKIN

AT&T presented the rebuttal testimony of Brian F. Pitkin, consultant with Klick, Kent & Allen, Inc. of Virginia. Mr. Pitkin testified as to the BCPM Release 3.1 submitted by BellSouth and GTE. Mr. Pitkin testified as to the comparison of the BCPM and Hatfield Model presented by Don Wood.

ART LERMA

AT&T presented the rebuttal testimony of Art Lerma, Regional Regulatory Chief Financial Officer for AT&T. Mr. Lerma testified as to the calculations of BellSouth's operating expenses that were populated in the BCPM 3.1 Model. Mr. Lerma also testified

as to GTE's operating expenses as populated by the BCPM 3.1 Model. Mr. Lerma's direct testimony addressed the expenses based on BCPM 2.0.

RICHARD GUEPE

AT&T presented the supplemental direct testimony of Richard Guepe, District Manager, Law & Government Affairs, Georgia. Mr. Guepe testified as to the present universal service subsidy requirements developed from the Hatfield Model for BellSouth, United and GTE territories in South Carolina; the revenue benchmark and cost inputs necessary to calculate the universal service subsidy requirements; respond to GTE witness Calnon's request for "interim" surcharges; address the mechanism for recovery of USF contributions and additional requirements to achieve a competitively neutral USF.

MIKE GUEDEL

AT&T presented the direct testimony of Mike Guedel, Manager Network Services, AT&T, Georgia. Mr. Guedel testified as to the elimination of CCLC charges and the reduction of access charges to a level to the forward looking economic cost incurred by the companies in providing access services.

ALLEN BUCKALEW

The Consumer Advocate presented the direct and supplemental testimony of Allen Buckalew, economist, J. W. Wilson &

Associates, Washington, DC. Mr. Buckalew testified as to whether the fund methods proposed by the LECs are consistent with the federal rules for the USF. Mr. Buckalew also testified as to his analysis of the cost studies presented by the LECs in support of the USF.

MICHAEL D. DIRMEIER, DAVID C. NEWTON AND JAMSHED K. MADAN

Mr. Dirmeier and Mr. Madan are principals in the Georgetown Consulting Group ("Georgetown"). Mr. Newton is an independent consultant currently employed by Georgetown. As a panel, these three witnesses (collectively, "Georgetown") filed rebuttal testimony on behalf of BellSouth. Georgetown testified that the inputs selected by AT&T for use in the Hatfield Model were inappropriate for determining the cost of providing basic local service in South Carolina. Specifically, Georgetown testified that the default values selected by AT&T, particularly for sensitive user adjustable inputs ("SUAI's") do not reflect the conditions of BellSouth in South Carolina and do not reflect cost or other conditions reasonably expected to occur in the future. Georgetown selected alternative values for SUAI's which more accurately reflected the conditions in South Carolina.

TIMOTHY J. TARDIFF

GTE presented the rebuttal testimony of Timothy J. Tardiff, Vice President at National Economic Research Associates of

Massachusetts. Dr. Tardiff testified as to his economic and engineering criticisms of the Hatfield Model. Dr. Tariff also responded to the direct testimony of Mr. Don Wood.

FRANCIS J. MURPHY

GTE presented the rebuttal testimony of Francis J. Murphy. Mr. Murphy is employed by Network Engineering Consulting, Inc. in Massachusetts. Mr. Murphy testified that he had analyzed and evaluated the various versions of the Hatfield Model in order to determine whether the Model is appropriate to use in establishing universal service obligations or in estimating costs or prices for unbundled network elements. Mr. Murphy testified that the Hatfield Model is subject to a myriad of economic and engineering flaws that are so severe so as to render the Model unusable for its intended purpose.

III. OVERVIEW OF UNIVERSAL SERVICE

Prior to discussing its findings and conclusions in this matter, the Commission finds it necessary to provide an overview of the fundamental changes in federal and state law that serve as a backdrop for the Commission's decision. One of the central challenges Congress faced in drafting the Telecommunications Act of 1996 ("Act") was how to open a new era of competition in local telephone service without jeopardizing the continued availability of what is known as "universal service." Universal service

refers to a nationwide telecommunications policy of ensuring access to certain basic telephone service for all Americans at affordable rates.

Prior to the Act, universal service was supported by a complex system of inter-customer and inter-service subsidies administered in part by state public utility commissions and in part by the FCC. Under this old regime, universal service was supported primarily by requiring ILECs to charge some customers (typically urban and business customers) above-cost rates so that they could charge other customers (typically rural and residential customers) rates that were below cost. Additional sources of subsidies have traditionally included services such as toll services and access charges. Access charges are the fees that both long distance carriers and end-user customers pay for using a local telephone company's network of lines and switches for terminating or originating long distance calls. Businesses or individuals that make many long distance calls help subsidize those persons who primarily make local calls.

This extensive system of implicit subsidies (i.e., subsidies embedded in an ILEC's rates) was feasible in the past, because local telephone service was primarily provided through a system of exclusive franchises granted and administered by the states. Before the Act, a single telephone company under rate-of-return

regulation typically provided local service for a specified geographic territory under an exclusive, state-granted franchise. For its part, the telephone company agreed to invest enormous sums required to build and maintain a state-of-the-art telephone network and to assume the obligation to serve all customers within its service territory at rates regulated by the state. In return, state regulators set rates that were designed to ensure that the telephone company would be paid for the cost of providing service and would have the opportunity to earn a reasonable return on the capital invested in the network. Because state regulators could control the rates charged to all customers, and because (for the most part) the incumbent telephone company faced no competition within its service area for basic local exchange service, the state could maintain this extensive system of inter-customer and inter-service subsidies to advance its universal service goals while still allowing the telephone company a reasonable chance to recover its costs and earn a fair rate of return.

In the Act, however, Congress abolished exclusive franchises in favor of competition. In doing so, Congress recognized that the implicit cross subsidies that have traditionally supported universal service could not be sustained in a competitive marketplace. Competitors who have no obligation to serve all

residents in the market will naturally target those customers who are charged above-cost rates or who provide a greater than average amount of revenues, and will easily undercut those rates. As a result, either the ILEC would be forced to lower its above-cost rates to meet competition or it would simply lose the high margin customers that currently support universal service. In either event, the ILEC would lose the source of funding that supports universal service. Accordingly, given the loss of universal service support from implicit subsidies, subsidized local rates would have to rise substantially to reflect the actual costs of providing service in the fully competitive environment created by elimination of exclusive franchises. To introduce competition in all markets while protecting universal service, Congress had to reshape fundamentally the funding of universal service.

To that end, Congress gave specific instructions in the Act concerning the form that the new universal service system should take. First, Congress set forth the key principles that the FCC and a special Federal-State Joint Board should follow in establishing a new fund. Thus, the Act states that "[c]onsumers in all regions of the Nation, including low-income consumers and those in rural, insular, high cost areas, should have access to telecommunications and information services" and that the federal

mechanism "should be specific, predictable and sufficient."

Section 254(b)(3), (b)(5) (emphasis added). Congress further directed the FCC, in consultation with the Joint Board, to establish a "definition of the services that are supported by Federal universal service support mechanisms." Section 254(c)(1). The new funding system would be designed to support this defined set of basic services.

In express terms, Congress mandated that the new system "should be explicit and sufficient to achieve the purposes of this section." Section 254(e) (emphasis added). Congress recognized that only a system that makes universal service support explicit--not a system that continues to rely on implicit subsidies built into retail rates--will be sustainable, and thus "sufficient" in a competitive marketplace. In addition, Congress specified that "[e]very telecommunications carrier that provides interstate telecommunications services shall contribute, on an equitable and nondiscriminatory basis, to the specific, predictable, and sufficient mechanisms established by the [FCC] to preserve and advance universal service." Section 254(d). Similarly, in Section 254(f), Congress directed that the states should establish mechanisms for supporting universal service that would be consistent with the new competitive environment and thus required that "[e]very telecommunications carrier shall

contribute, on an equitable and nondiscriminatory basis, in a manner determined by the State to the preservation and advancement of universal service in that State." Through these requirements, Congress sought to ensure that the new universal service funding system--unlike the existing system of implicit subsidies--would not create regulatory distortions that artificially advantage some carriers over others in the competitive marketplace.

Congress also sought to ensure that funding from the new federal mechanism would be available only to carriers that actually undertook the task of providing basic services to residents in the rural, insular and high cost areas that typically require universal support. Thus, Section 254(e) of the Act specified that a common carrier may be designated as "eligible" to receive support only if "throughout the service area for which the designation is received," the carrier "offer[s] the services that are supported by Federal universal service support mechanisms under Section 254(c)" and "advertise[s] the availability of such services and the charges therefor using media of general distribution." The clear objective of these requirements is to ensure that a carrier will receive a subsidy payment from the government only if it furthers the goals of universal service by genuinely making the basic set

of supported services available to everyone in a high cost area. In short, Congress did not intend to have subsidies paid to carriers who, through restricted advertising or other stratagems, attempted to attract only those profitable customers at the high end of the revenue spectrum.

In addition to Congress' vision with respect to the preservation and advancement of universal service, the South Carolina General Assembly (through S.C. Code Ann. § 58-9-280) has required the Commission to "establish a universal service fund (USF) for distribution to a carrier(s) of last resort" so as to continue "South Carolina's commitment to universally available basic local exchange telephone service at affordable rates and to assist with the alignment of prices and/or cost recovery with costs."

In its May 8, 1997 Universal Service Order, the FCC attempted to implement the commands of Section 254 by establishing a new federal system for supporting the costs of universal service. Following the direction of Section 254(c)(1), the FCC first established a definition of the basic services that would be supported by the new federal funding mechanism. The FCC thus specified a list of basic services--including voice grade access to the public switched network, access to operator services, access to long distance or "interexchange" service, and

access to directory assistance--as the set of supported services under the Act. Id. at ¶ 56.

One of the most important issues that the FCC had to address was how it would calculate the cost of providing universal service. In other words, the FCC had to determine the size of the implicit subsidy flow built into current rates that allows ILECs to maintain low charges for basic service. The FCC first ruled that, in determining the size of the subsidy, it would rely on projections of so-called forward-looking economic costs. Id. at ¶ 224. The FCC's particular version of a forward-looking cost measure purports to project how much it would cost today to build and operate a network to provide the services in question using the most efficient technology available.

The FCC gave the states the opportunity to submit a cost model for use in calculating interstate support for non-rural ILECs serving rural, insular and high cost areas in their respective states. However, to obtain federal universal service funding based on a state-selected cost model, that model must meet the following criteria:

1. The technology assumed in the cost study or model must be the least-cost, most efficient, and reasonable technology for providing the supported services that is currently being deployed.

2. Any network function or element, such as a loop, switching, transport or signaling, necessary to produce supported services must have an associated cost.
3. Only long-run forward-looking economic cost may be included.
4. The rate of return must be either the authorized federal rate of return on interstate services, currently 11.25 percent, or the state's prescribed rate of return for intrastate services.
5. Economic lives and future net salvage percentages used in calculating depreciation expense must be within the FCC-authorized range.
6. The cost study or model must estimate the cost of providing service for all businesses and households within a geographic region.
7. A reasonable allocation of joint and common costs must be assigned to the cost of supported services.
8. The cost study or model and all underlying data, formulae, computations, and software associated with the model must be available to all interested parties for review and comment.
9. The cost study or model must include the capability to examine and modify the critical assumptions and engineering principles.
10. The cost study or model must deaverage support calculations to the wire center serving area level at least, and, if feasible, to even smaller areas such as a Census Block Group ("CBG"), Census Block ("CB"), or grid cell.

Id. at ¶ 250.

After deciding upon a methodology for determining the overall size of universal service costs that required support from a subsidy source, the FCC decided to construct the federal

universal fund to cover only 25 percent of those costs. The FCC explained that under the current separations process, roughly 25 percent of the costs of the local loop are assigned to the interstate jurisdiction and, therefore, the new federal fund would cover only 25 percent of the total cost of subsidizing universal service. Unless this determination is reversed through a pending appeal of that order, the states must fund the remaining 75 percent of these costs above the FCC's arbitrary revenue benchmark. Id. at ¶ 269.

The States had a deadline of April 24, 1998 to submit to the FCC a cost model for use by the FCC in calculating federal support for non-rural ILECs serving rural, insular and high cost areas. Distributions from the federal fund will begin January 1, 1999. If a state-selected study fails to meet the FCC's criteria, or if a state fails to submit a study, the FCC will itself determine the interstate portion of the universal service subsidy for that state according to the FCC's own forward-looking cost methodology. The FCC is currently evaluating various cost models for this purpose; however, it has not yet selected a model.

The FCC's criteria are binding for federal universal service funding support only. However, although this Commission realizes that it is not bound by these criteria when establishing its

intrastate universal service fund, it finds that the criteria are reasonable and that using the same cost model and cost methodology to calculate both the federal and state fund will simplify the state fund calculation. Furthermore, if the Commission does not select a model consistent with the FCC's criteria for determining the federal cost of universal service, then the amount of federal support for South Carolinians will be determined by a federal model based upon national average default inputs. Such a model could not possibly provide as accurate a view of the universal service requirements in South Carolina as would a model developed with inputs specific to South Carolina. This Commission is best suited to determine which model and inputs best calculate the cost of providing universal service in South Carolina.

In the instant proceeding, therefore, the Commission has selected an appropriate cost model and inputs that can produce reasonable cost estimates of providing universal service in South Carolina and that can meet the FCC criteria for calculation of the appropriate level of support from the federal high cost fund. The selection of this correct cost proxy model and inputs will ensure that the actual cost of providing high quality local exchange service to rural areas is accurately estimated. Further, it will ensure that access to basic local service is

maintained even as local exchange competition erodes the implicit subsidies that historically have been used to maintain affordable rates for rural subscribers. Moreover, the Commission concludes that the selection of the correct cost proxy model and inputs will encourage CLECs to develop business plans that serve rural South Carolinians and will provide incentives to ILECs to continue to make capital investments in their high cost serving areas of this State.

The parties to this proceeding have presented the Commission with two cost proxy models to consider as well as various sets of cost inputs to those models. The ILECs--BellSouth, United, and GTE--contend that the Benchmark Cost Proxy Model Version 3.1 (BCPM 3.1) and the South Carolina company-specific inputs submitted for use in that model produce the best estimation of universal service costs in their territories in South Carolina. Likewise, AT&T and MCI submit that the Commission should adopt the Hatfield Model Version 5.0a (HM 5.0a) as the correct cost proxy model for estimating the cost of providing universal service in South Carolina.

In general, cost proxy models are used to provide reasonable cost estimates when it is not possible to specifically identify the cost of serving individual customers. A determination of costs at the appropriate geographic level is more effectively

accomplished with a proxy model than by attempting to determine the cost of serving each individual customer. Therefore, both BCPM 3.1 and HM 5.0a provide estimates of the cost of providing universal service in South Carolina by approximating the cost of serving actual subscribers rather than attempting to define the cost of serving each individual subscriber.

The Commission finds that it is axiomatic that if new entrants are to enter rural markets, they must have a vehicle that allows them to recover their costs of service and yet still compete successfully against ILEC rates that are below cost. A properly sized universal service fund is that vehicle. If the fund is properly sized, new entrants will have the appropriate incentives to bring the benefits of competition to rural customers. If the fund is undersized, the Commission concludes that rural South Carolinians will undoubtedly suffer. Without a method to recover their costs, CLECs will have no incentive to enter high cost areas. Moreover, infrastructure investment by ILECs will decline, because those firms will no longer have the means by which to recover additional capital improvements in high cost areas. Customers in high cost areas will inevitably see declining service quality relative to lower cost areas and will not have the same access to advanced telecommunications services and information services as do lower cost customers. ILECs will

lose the lower cost, high margin customers to competition and will be left to serve predominantly high cost, low margin customers.

Ultimately, because only the low margin customers will be left to cover the full cost of the network, prices for those predominantly high cost customers will have to increase, thus jeopardizing the availability of universal service in this State. Therefore, the Commission has selected the cost proxy model and inputs it believes will best ensure that South Carolinians in rural and other high cost areas will realize the benefits of competition in the local exchange marketplace and will continue to enjoy high quality service from their provider of choice.

Finally, as was made clear by Mr. Varner and Mr. Oliver during the November 1997 hearings, we wish to reiterate this proceeding is not a rate case. The whole purpose of establishing a universal service fund is to ensure that basic local exchange rates will remain affordable. The Commission's own guidelines referenced above state that for every dollar of funding an eligible carrier receives from the universal service fund, that carrier's rates will be reduced by that amount of money.

IV. FINDINGS AND CONCLUSIONS

A. BCPM 3.1 More Accurately Locates Customers In Rural and Other High Cost Areas In South Carolina Than Does HM 5.0a.

A cost proxy model that estimates the cost to serve rural areas must be able to locate telephone customers with a reasonable degree of accuracy in those areas. The ability to reasonably estimate the cost to serve "high-cost" areas is an essential characteristic of a model that is used to determine the required funding for state and federal universal service programs.

Both BCPM 3.1 and HM 5.0a use the Census Block as the starting point for their customer location methodologies. The Census Block is the finest level of geography for which Census data is provided, such as housing units. Census Blocks are areas bounded on all sides by visible features such as streets, roads, streams, and railroad tracks, and by invisible boundaries such as city, town, township, and county limits, property lines, and short, imaginary extensions of streets and roads. (Tr. Vol. III at 252-253). The U.S. Bureau of the Census provides housing unit counts at the Census Block and Census Block Group level. A Census Block Group is a collection of Census Blocks generally containing between 250 and 550 housing units, with an ideal count

of 400 units. On average, there are 31 Census Blocks in a Census Block Group. (Id.)

In urban areas, Census Blocks are fairly small. For example, in a downtown area, they tend to be 0.005 square miles in size. In a typical suburban area, they tend to be in the 0.5 to 1.0 square mile range. In rural areas, however, Census Blocks tend to be much larger. Census Blocks as large as 60 square miles are not uncommon, with 20 square miles being more typical. (Tr. Vol. III at 253). Thus, a cost proxy model's customer location methodology for placing customers within a Census Block is much more critical in rural, low density areas.

The first step in accurately establishing customer locations is the specification of the appropriate wire center boundaries. BCPM 3.1 relies on publicly available wire center boundary data obtained from Business Location Research ("BLR"). (Tr. Vol. III at 247). Next, a BCPM 3.1 customer location algorithm partitions the area of a wire center into "microgrids," roughly 1,500 feet by 1,700 feet in size (0.09 square miles). Thus, each Census Block within the serving wire center is overlaid with microgrids, unless the entire Census Block falls within a single microgrid. (Tr. Vol. III at 257).

In the rural areas of the wire center, the allocation of customer locations is based upon the road network, the location